BEFORE THE

Federal Communications Commission

WASHINGTON, D.C. 20554

MM Docket No. 87-268

In the Matter of)
)
ADVANCED TELEVISION SYSTEMS AND)
THEIR IMPACT UPON THE EXISTING)
TELEVISION BROADCAST SERVICE)

To: The Commission

COMMENTS

Comes now the National Radio Astronomy Observatory, Socorro, New Mexico (NRAO New Mexico) and by its attorney hereby submits its Comments in response to the Commission's Second Further Notice of Proposed Rule Making, FCC 92-332 released August 14, 1992. In support whereof the following is shown:

1. In its Second Further Notice of Proposed Rule Making, the Commission seeks comments concerning its proposal to establish a Table of Allotments in order to facilitate the implementation of high definition television service throughout the United States. NRAO, an institution specializing in radio astronomy, is operated by Associated Universities, Inc. (AUI), a nonprofit corporation organized in 1946 to establish and operate, with government and other support, large-scale research facilities for the benefit of the interested scientific community. AUI is sponsored by nine major universities: Columbia, Cornell, Harvard, Johns Hopkins, Massachusetts Institute of Technology, Pennsylvania, Princeton, Rochester and Yale. AUI operates NRAO under a cooperative agreement with the National Science Foundation, an independent agency of the Federal Government concerned primarily with the support and encouragement of basic research, training and education in the sciences, and the interchange and dissemination of scientific information.

2. NRAO was founded in Green Bank, West Virginia in 1956 to provide scientists with large radio telescopes necessary for the continued advancement of radio astronomy. Its first site was located near Green Bank, West Virginia in order to take advantage of good shielding from man-made radio noise provided by the Allegheny Mountains and is protected from interference by the State of West Virginia and by the Federal Communications Commission which established a radio quiet zone in 1958. Since then, NRAO has expanded its facilities to include a Very Large Array (VLA) near Socorro, New Mexico, and a Very Long Baseline Array (VLBA) with ten radio telescope sites across the United States and its territories from Mauna Kea, Hawaii to St. Croix, Virgin Islands.

3. The VLA is located at a site on the 7000-foot elevation Plains of San Agustin, 50 miles west of Socorro, New Mexico. Completed in 1979, the VLA consists of twenty-seven interconnected antennas spaced over four hundred square miles and produces radio images of unparalleled quality and precision. The VLBA consists of ten automated 25-meter diameter antennas located in or near Mauna Kea, Hawaii: Brewster, Washington; Owens Valley, California; Kitt Peak, Arizona; Pie Town, New Mexico, Los Alamos, New Mexico; Fort Davis, Texas; North Liberty, Iowa; Hancock, New Hampshire; and St. Croix, Virgin Islands. Data from each receiver are combined in a specially designed digital computer system allowing the synthesis of a single radio telescope 8000 kilometers (5000 miles) in diameter, the largest dedicated telescope in the world. Both the VLA and the VLBA are controlled by NRAO in Socorro, New Mexico.

4. NRAO New Mexico is concerned that the Commission's proposed HDTV allotments will adversely affect the operations of the VLBA and VLA unless adjacent channel protection is afforded to Channel 37, the band allotted exclusively for radio astronomy observations, at the relevant receiver sites for the VLA and the VLBA. Attachment A hereto consists of the site coordinates for each receiver site. The proposed allotment of Channel 38 in Christiansted, Virgin Islands could result in placement of an adjacent channel transmitter only a few kilometers from the VLBA radiotelescope in St. Croix. Moreover, Channel 36 or Channel 38 transmitters anywhere in the Virgin Islands (or near any other site listed in Attachment A) would prevent astronomical studies with that radiotelescope in the 608 - 614 MHz (Channel 37) radio astronomy band.

5. NRAO New Mexico also requests that the Commission provide harmonic protection in its HDTV allotments for the following radio astronomy frequency

allocations: 1330 - 1400 MHz (footnote 718); 1400 - 1427 MHz (Primary); 1610.6 - 1613.8 MHz (Primary WARC-92); 1660 - 1670 MHz (Primary); and 1718.8 - 1722.2 MHz (footnote US256). The radio astronomy sites listed in Attachment A conduct studies in these bands. The third harmonics of Channels 14, 25, 27, 28 and 31 fall in one of these bands; the second harmonics of Channels 46, 47, 48, 49, 50, 51, 52, 53, 54 and 69 fall in one of these bands as well.

For the foregoing reasons, the Commission's HDTV Table of Allotments should be constructed in a manner which will afford adjacent channel protection and second and third harmonic protection to the NRAO radiotelescopes comprising the VLA and the VLBA.

Respectfully submitted,

NATIONAL RADIO
ASTRONOMY OBSERVATORY
(SOCORRO, NEW MEXICO)

By: 

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Channel 37 is utilized at the following radio astronomy installations:

Location	N. Latitude	W. Longitude
(1) Arecibo, PR	18°-20'-46"	66°-45'-11"
(2) Socorro, NM (Very Large Array [VLA])	34°-03'-43"	107°-37'-04"
(3) Green Bank, WV (Green Bank Telescope [GBT])	38°-25'-59"	79°-25'-59"
(4) Pie Town, NM (Very Long Baseline Array [VLBA] site)	34°-18'-04"	108°-07'-09"
(5) Kitt Peak, AZ (VLBA site)	31°-57'-23"	111°-36'-45"
(6) Los Alamos, NM (VLBA site)	35°-46'-31"	106°-14'-44"
(7) Fort Davis, TX (VLBA site)	30°-38'-06"	103°-56'-41"
(8) North Liberty, IA (VLBA site)	41°-46'-17"	91°-34'-27"
(9) Brewster, WA (VLBA site)	48°-07'-52"	119°-41'-00"
(10) Owens Valley, CA (VLBA site)	37°-13'-54"	118°-16'-34"
(11) Saint Croix, VI (VLBA site)	17°-45'-31"	64°-35'-03"
(12) Hancock, NH (VLBA site)	42°-56'-01"	71°-59'-12"
(13) Mauna Kea, HI (VLBA site)	19°-48'-16"	155°-27'-29"